1879MNRAS..40...81N

Note on the Correction to the Mean Longitude of Hansen's Lunar Tables. By Prof. S. Newcomb.

In vol. xxxix. No. 9, of the *Monthly Notices* Mr. Lynn shows that the correction to the mean longitude of the Moon has apparently diminished during the last two years, and concludes that the mean error is probably still diminishing. I wish to call attention to the fact that the fluctuations in the course of the error may be accounted for by the seventeen-year term due to the action of *Jupiter*, computed by Mr. Neison, namely—

$$\delta l = 2''{\cdot}2 \sin (2\varpi - 2J),$$

ϖ being the longitude of the Moon's perigee and J the mean longitude of *Jupiter*.* Substituting for ϖ and J their values in terms of the time, the correction becomes

$$\delta l = 2''{\cdot}2 \sin \{293^\circ + 20^\circ{\cdot}66\,(t - 1870{\cdot}5)\}.$$

The dates of its maxima and minima are as follows :—

Maximum, of +2″·2	1860·2,	1877·6.
Minimum, of −2·2	1868·9,	1886·3.

It is therefore to be expected that the positive error of the Tables would reach a minimum about 1878·0.

I have taken the corrections to Hansen's mean longitude given in my *Researches on the Motion of the Moon*, p. 268, interpolated them to the middle of each year from 1876 to 1885, and applied Mr. Neison's inequality. The results are :—

Year.	Long Period Correction. ″	Neison's Correction. ″	Sum. ″
1876·5	− 9·4	+ 2·0	− 7·4
77·5	− 9·9	+ 2·2	− 7·7
78·5	−10·4	+ 2·1	− 8·3
79·5	−10·9	+ 1·7	− 9·2
80·5	−11·5	+ 1·1	−10·4
81·5	−12·0	+ 0·3	−11·7
82·5	−12·6	− 0·4	−13·0
83·5	−13·2	− 1·1	−14·3
84·5	−13·8	− 1·7	−15·5
85·5	−14·4	− 2·1	−16·5

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* See *Monthly Notices*, vol. xxxvii. pp. 359 and 428.

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Mr. Lynn's results for 1878 were:—

	″
From Meridian observations	−8·23
„ Altazimuth „	−7·48

They are as nearly accordant with the empirical theory as could be expected. The errors in 1876 are apparently 2″ greater than theory. This may be due in part to inequalities not yet discovered, but is more likely to arise from systematic errors of a personal character in noting the times of transit of the Moon's limb. For several years preceding 1876 the Moon's R.A. as observed at Greenwich and Washington was some 1″ or 2″ greater than that derived from occultations, and from the meridian observations to other Observatories. Hence arose the constant difference between the corrections for 1875·0 found by Captain Tupman from observations at a number of Observatories and by myself from Greenwich and Washington alone. The occultations seem to show that the constant error was in my own results.

On the whole, I do not yet see any good reason to believe that the course of the errors during the next six years will be materially different from that above given. It would be a matter of interest if the few Observatories where the Moon is systematically observed would, after the end of each year, publish the mean correction to the Moon's longitude derived from the observations of the year.

On Recent Changes in the Mean Error of Longitude of Hansen's Lunar Tables.

By W. T. Lynn, B.A.

The critical point apparently reached in the mean error of longitude of the Moon, as assigned by Hansen's Tables, has led me to examine its circumstances a little more minutely than in my previous paper printed in the last *Supplementary Notice*; and, by the permission of the Astronomer Royal, I beg to offer the Society the following results of that examination.

It will have been noticed that the diminution of the error in 1878, to which I called attention as above, is shown by the observations made both with the meridian and altazimuth instruments. But in what follows I have discussed the altazimuth observations only, which are not only more numerous, but distributed through a larger part of each lunation than those made with the Transit-Circle.

My previous paper left it doubtful whether the turning point was in the year 1876 or 1877. I have now compared the mean error of longitude from the altazimuth observations in 1877,

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